to say that this jaw does not belong to *Amphitherium*—it very probably does; but it certainly does not afford decisive evidence on which to base an extensive superstructure, and to make *Amphytherium* the type of one family, while *Amphitylus* and *Amphilestes* (regarded by Owen as closely related to the former) are referred to the *Triconodontidæ*. Then, again, exception may be taken to the interpretation of the molar structure in the jaw in question. Prof. Osborn regards the teeth as consisting of two cusps and a talon in line, approximating to the fashion of *Amphilestes;* but to us they appear to resemble those of the Upper Jurassic genus *Amblotherium*, in which the molars consist of a trilobed blade and a posterior talon. Now, *Amblotherium* is made the representative of a family which is taken as the type of the Insectivora Primitiva. Apart from the question of what *Amphitherium* really is, the molar teeth of *Amblotherium*, as already said, differ considerably from those of *Amphilestes* (Prodidelphia); but, since precisely analogous differences occur in a single family of existing Marsupials, these differences do not appear to afford grounds for even family, let alone ordinal, distinction. No definite characters are, indeed, given by which the Insectivora Primitiva (p. 235) are to be distinguished from the Prodidelphia; and if we compare the figure of the mandible of *Amphilestes*, given on p. 228, with that of *Amblotherium*, represented in Plate ix., Fig. 11, the resemblance in the contour of the posterior portion of the jaw is so close that scarcely even generic distinction could be drawn from this part. The conclusions drawn from this portion of the jaw in the different forms are indeed very remarkable. Thus we have already noticed how the low condyle is given as a character of the *Tritylodontidæ*, and yet the feature is totally wanting in the first genus, *Amphilestes*, which agrees exactly with *Amblotherium* in its lofty condyle. The alleged broad and narrow coronoids of the two forms may be in great part due to the effects of pressure. The absence of inflection in the angle of *Amblotherium* is shared by some of the forms included in the *Triconodontidæ*. Then, again, we are totally unable (after repeated examinations of the types) to see how the lower jaw, on which *Peraspalax* was founded, can be even generically distinguished from *Amblotherium*, the dental formula being, with the exception of an additional lower molar, identical; and yet the one genus is referred to the Prodidelphia, and the other to the Insectivora Primitiva. As another instance, the general similarity in the structure of the lower molars of *Spalacotherium* to those of *Chrysochloris* coupled with an analogous similarity existing between the upper ones of *Peralestes* and those of the same existing genus, suggests at all events a very considerable presumption that the two fossil genera may be identical. We find, however, *Spalacotherium* placed in the *Triconodontidæ*, while *Peralestes* is made the type of another family of the Prodidelphia, which includes the above-mentioned *Peraspalax*. Now, even if the above obvious resemblance is ignored, we totally fail to see any reason for including *Spalacotherium* in the *Triconodontidæ*, and agree with Prof. Marsh in regarding it as the type of a distinct family. If, moreover, any of these forms are to be referred to the Insectivora, we should have thought that *Spalacotherium*, with its *Chrysochloris*-like molars, and the reduction of its lower incisors to the Eutherian three, was the very one which had a claim to such a position. In regard to the new genus *Kurtodon*—the type of the *Kurtodontidæ*—we can only say that there appears to us to be no evidence that the upper jaws on which it is founded may not belong to one of the genera named on the evidence of the mandible.

Other points might be noticed if space permitted; but we have indicated enough to show that a great deal more must be absolutely proved before many of the genera admitted by Prof. Osborn can be even allowed to stand as definitely distinct; while, as to the proposed division of the Polyprotodont forms into Insectivora and Marsupialia, we have shown that in its present form it breaks down hopelessly at every point, although we are far from saying that all the known forms are certainly Marsupial. It appears, however, desirable, till we attain much fuller knowledge of their organization, to leave a large proportion of them in a single ill-defined family.

In criticizing this memoir we have not hesitated, in what appear to us to be the true interests of science, to speak freely. We should, however, be unjust if we failed to recognize the amount of labour of a very trying kind which the author has bestowed on the subject; and we especially commend the value of his observations on the Multituberculata. It is also a decided advantage to have all the American and European forms compared together by one who has had the good fortune to study so many of the types from both areas. Finally, no one can fail to be struck with the excellent illustrations with which the monograph is adorned, a large number of which, we believe, are from the author's own drawings.

EARTH SCULPTURE.

Les Formes du Terrain. Par Lieut.-Colonel G. De la Noë, avec la collaboration de Emm. de Margerie. 2 Vols. (Text, pp. 205; Plates xlix.). (Paris, 1888.)

THE origin of the features of the earth's surface must always prove an attractive subject no less to the geographer than to the geologist. The one describes and the other expounds; and the work before us is an admirable example of what may be done by the joint labours of geologist and geographer in illustrating and explaining the form of the ground.

In turning over the pages of the work, and in contemplating the many instructive diagrams and pictorial illustrations, one is prepared for a more exhaustive treatment of the origin of scenery than is really to be found in these volumes. So far as the geologist is concerned, the work is mainly a treatise on sub-aërial denudation, and with special reference to France. It is almost entirely occupied with the method of denudation by rain and rivers, and with an account of the features which they originate. We are told how different rocks are disintegrated by surface agencies, and how the broken material is afterwards transported by streams. Attention is especially called to the action of running water on rocks of varying character and inclination, to the influence of vegetation in preserving slopes at certain inclinations, and to the effect of rain in diminishing the angle of slopes. The influence of climate is dwelt upon, and it is shown how the perme-

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able strata are characterized by dry valleys and few water-courses, while the impermeable beds support abundant streams.

The relations of disturbed strata, of anticlinals and synclinals to valley and hill, are duly noted ; and it is pointed out how the flow of rivers is determined by the lie of the land when it is upraised from beneath the sea-level, and that in few cases are their courses directed by faults or fractures. The authors explain the recession of escarpments by the undermining or undercutting of softer beds and the production of landslips ; and they note the influence of lateral streams in eroding these softer strata at the foot of the hills, a subject illustrated by reference to the Wealden area and other districts.

Little is said about marine denudation, for the action of the sea is essentially limited to the destruction of cliffs along its margin, and to the formation of marine platforms. Concerning great "plateaux of abrasion," or so-called "plains of marine denudation," the authors express their opinion that it would be wrong to attribute their formation exclusively to the sea, for they consider that the prolonged action of sub-aërial forces is to reduce the land to a level. Nor do the authors attribute great excavating power to glaciers. In their opinion these icy agents occupied and modified old valleys, and have not always effaced the pre-Glacial alluvial deposits ; and they see little evidence of post-Glacial erosion. In these respects their observations are based on local and limited evidence ; for in this country, although the main features were marked out in pre-Glacial times, there is abundant evidence of denudation by glacial action, and subsequently in times when the ice had done its work.

The authors have clearly pointed out that the topographical features are as a rule in direct relation with the geological structure ; indeed, the form of the ground is one of the most important guides to the field-geologist in his delineation of the superficial distribution of the rock-masses. Nevertheless, in the explanation of the origin of our scenery, there are many points concerning the original extent of each formation, and the changes in texture which the rocks have undergone, that are but briefly, if at all, noticed in this work. In this respect, however, each country must be studied in detail before the complex history of its physical features can be deciphered.

The present work, as before stated, deals mainly with the mode in which rain and rivers sculpture the surface of the earth. It is an instructive summary of what is known on this subject, supported by original observations and by references to the principal authorities, and illustrated in a far more sumptuous manner than has ever been attempted in this country. H. B. W.

OUR BOOK SHELF.

Eclectic Physical Geography. By Russell Hinman. (New York: Van Antwerp, Bragg, and Co., 1888.)

To quote the author's preface, "The aim of this book is to indicate briefly what we know or surmise concerning the proximate causes of the more common and familiar phenomena observed at the earth's surface." The book commences with an introduction to the general laws of Nature, in which short outlines of the properties of matter and the various forms of energy are given. The earth is then treated as a planet ; its relation to the sun and stars, and the nature and results of its movements, being described. Next come chapters on the atmosphere, the sea, the land, meteorology ; and finally, the various forms of life. The causes of the movements of the atmosphere, sea, and land, and their respective effects, are all clearly stated. Brief outlines are given of the gradual disintegration of terrestrial rocks, and the subsequent transportation and accumulation of the products. Fossils and their teachings also receive attention. In short, nothing of importance has been omitted.

The general plan of the book bears a considerable resemblance to that suggested by the syllabus of the Science and Art Department's course of elementary physiography, and with a teacher to extend the preliminary chapter on the forms of energy, would form an admirable text-book for that subject. The order in which the subjects are taken is practically the same, and is obviously the most natural and rational.

The chapters on the forms of life and their distribution will prove of special interest to young students or general readers. There is a good outline of the development theory, and of what we know of man from prehistoric times.

The book throughout is illustrated by a great number of drawings, maps, and charts, which not only beautify but illustrate the text in a most admirable manner. The charts are drawn on three different systems of projection, each system being applied where it is most suitable ; and, what is very important, the different systems are fully explained. A book like this cannot fail to impress the reader with a due sense of the importance of diagrammatic representation in facilitating description. The various sectional drawings are especially valuable in this respect.

The book thoroughly deserves the highest praise, and as an introduction to the study of science must certainly rank among the best.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Prophetic Germs.

PROF. RAY LANKESTER has mistaken me. When I said in my last letter of October 8 that "all organs whatever do actually pass through rudimentary stages in which actual use is impossible," I referred specially to the embryological development of the individual. This is a fact which cannot be denied. But on the Darwinian hypothesis this fact applies equally to the birth of species—which are nothing but the passing results of individual variation. If true now of all individuals, it must, on that hypothesis, have been true of them for all time.

Inheritance is no explanation of this fact. It is merely one part of the fact separately stated. Neither is "correlation of growth" any explanation of it. This, again, is a mere phrase stating in another form the very fact which it pretends to explain. All organic growths are "correlated." But with what? First, with each other ; and, secondly, with some combined use, which invariably lies in the future when such growths begin. "Correlation of growth" is the law under which "prophetic germs" begin to be developed ; and this prophetic character becomes all the more marked in proportion as we carry back existing forms of life to the forms which were primæval. It is a favourite idea among the disciples of Darwin that the embryological development of individuals represents in epitome the whole history of organic life. I do not see why they should object to it when it leads us to the conclusion that the whole organic world must have begun in germs which were prophetic—that all organs must have come into being before they could be used.

ARGYLL.

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